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ARCHIVES OF PEDIATRICS

A MONTHLY DEVOTED TO THE

DISEASES OF INFANTS AND CHILDREN

JOHN FITCH LANDON, M.D., Editor

LEADING ARTICLES IN THIS NUMBER

Total Child Care in a Temporary Shelter.
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A Study of Mongolism and Non-Mongoloid Mental Retardation in Children.
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Intervertebral-Disc Lesions. A New Etiological Concept.
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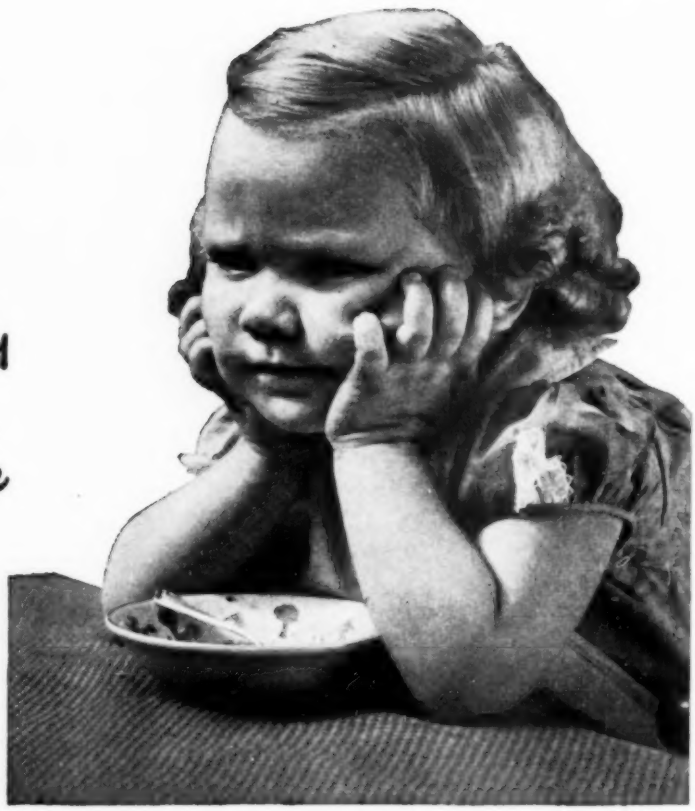

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Two years ago, findings of importance to dietitians everywhere were published, emphasizing the superiority of reconstituted MINUTE MAID Fresh-Frozen Orange Juice over home-squeezed juice of the same type oranges, in three respects:

(a) *Average levels of ascorbic acid significantly higher in* MINUTE MAID: Obviously, this advantage of MINUTE MAID, observed in the samples tested, is susceptible to variation, from season to season, as crops differ. It should be emphasized, however, that, penny for penny and year after year, the lower-priced MINUTE MAID offers the housewife *more* ascorbic acid than she could get from home-squeezed orange juice.

(b) *Peel oil content significantly lower:* Samples of orange juice, home-squeezed by typical housewives, showed contents of peel oil, a cause of allergic response and poor tolerance, especially in infants, were up to 700% higher than in MINUTE MAID!

(c) *Bacterial counts dramatically lower:* Bacterial counts were found to be as high as 350,000 per ml. in home-squeezed samples, but were uniformly low in MINUTE MAID.

Since publication of the above findings, more and more physicians are recommending MINUTE MAID Fresh-Frozen Orange Juice in place of home-squeezed orange juice where optimum year-around intake of natural Vitamin C is indicated.

And now comes more evidence in favor of MINUTE MAID . . .

New Assays Reaffirm Dietary Advantages of Minute Maid Fresh-Frozen Orange Juice on a Cost Basis

A second report comparing the individual mineral and vitamin values of MINUTE MAID Fresh-Frozen Orange Juice and home-squeezed juice of the same type oranges has recently been published.

In this latest study, each sample was analyzed separately. The analyses showed that MINUTE MAID Fresh-Frozen Orange Juice was equal to, or superior to, the home-squeezed juice in *all* of the components listed below:

TABLE

Mean Values in Samples Tested

COMPONENT	UNITS	MINUTE MAID FRESH-FROZEN ORANGE JUICE	HOME-SQUEEZED ORANGE JUICE
Betaine	mg./100 ml.	49	46
Biotin	mcg./100 ml.	0.26	0.26
Choline	mg./100 ml.	12	12
Cobalt	mcg./100 ml.	74	67
Folic acid	mcg./100 ml.	2.2	2.2
Iodine	mcg./100 ml.	0.24	0.21
Manganese	mcg./100 ml.	33	18
Nitrogen			
Total	mg./100 ml.	104	79
Amino	mg./100 ml.	22	22
Volatile	mg./100 ml.	8	7
Non-volatile	mg./100 ml.	96	72
Pantothenic acid	mcg./100 ml.	146	145
Para-amino-benzoic acid	mcg./100 ml.	4	4
Phosphorus	mg./100 ml.	19	18
Potassium	mg./100 ml.	380	290
Riboflavin	mcg./100 ml.	18	17
Tocopherols	mg./100 ml.	107	104
Vitamin A	mcg./100 ml.	19	16
Thiamine	mcg./100 ml.	87	83
Vitamin B_{12}	mcg./100 ml.	0.0022	0.0012

Although the results are again susceptible to variation according to crop and year, Fresh-Frozen MINUTE MAID was equal to the home-squeezed juice in the samples tested for the largest number of components listed; and in the mean values for iodine, manganese, potassium, Vitamins A and B_{12}, MINUTE MAID showed appreciably *higher* values.

SUMMARY

These new findings help enlarge professional knowledge of the nutrient constituents of orange juice in general and add fresh evidence that, on a cost basis, MINUTE MAID Fresh-Frozen Orange Juice has significant dietary advantages. Penny for penny, MINUTE MAID offers not only *more* Vitamin C, but also *more* of all the other vitamins and minerals listed than home-squeezed orange juice.

Taken in conjunction with the previously published findings, this should confirm the choice of physicians who recommend MINUTE MAID in place of home-squeezed orange juice.

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(1) Rakieten, M. L., *et al.*, Journal of the American Dietetic Association, October, 1951.
(2) Joslin, C. L., and Bradley, J. E., Journal of Pediatrics, Vol. 39, No. 3, pp. 325-329 (1951).
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(4) Assn. Official Agricultural Chemists: Methods of Analysis, 7th ed. Washington: Assn. Off. Agric. Chemists, 1950.

Reference #3 still available in reprint form.

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WALLACE R. ROY, Ph.D.,
Director of Research

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References: *1. Primer on the rheumatic diseases; prepared by a committee of the American Rheumatism Association. Special article: J.A.M.A.* **152**:*323 (May 23) 1953. 2. Breese, B.B.: J.A.M.A.* **152**:*10 (May 2) 1953. 3. Stollerman, G.H.: J.A.M.A.* **150**:*1571 (Dec. 20) 1952. 4. O'Brien, J.F., and Smith, C.A.: Am. J. Syph., Gonor. & Ven. Dis.* **36**:*519 (Nov.) 1952.*

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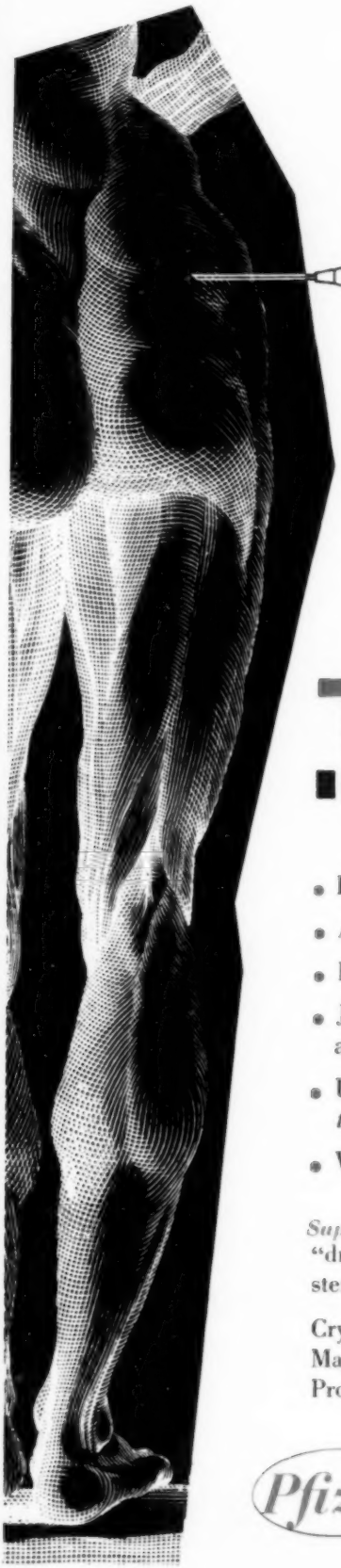

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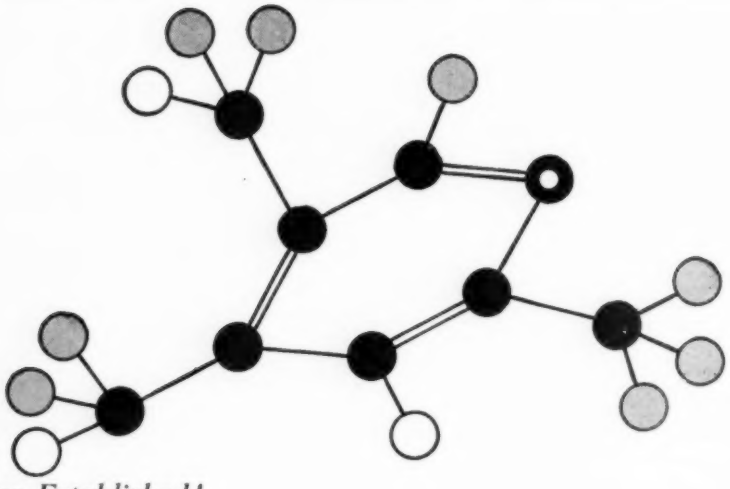

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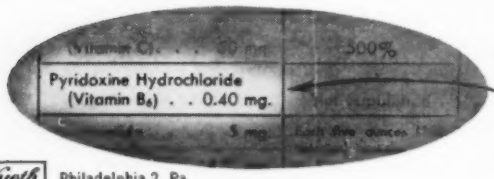

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TOTAL CHILD CARE IN A TEMPORARY SHELTER*

DOROTHY C. Y. YANG, M.D., M.SC. (PED.)

AND

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New York.

Children's Center of the Department of Welfare of the City of New York is a temporary shelter caring for 350 boys and girls, aged 2 to 16 years. Most of the children admitted to the Children's Center are under-privileged children from "broken homes" with the worst possible psychologic, social and economic background. They are placed in the Center by the City for temporary care until a more satisfactory permanent disposition can be made. There are about 1400 admissions in a year with more Negro and Puerto Rican than white children. The duration of residence for each child varies from a few days to one to two years. Most of the children stay longer than three months. The building contains a nursery, girls' dormitories, boys' dormitories, a public school, a swimming pool, a gymnasium, a children's theatre, clinic, infirmary, conference rooms and administrative offices.

The child's stay in the Center, even though temporary, is an important phase in his growth and development. Care of the total child (physical, mental, emotional and social), with emphasis on the psychologic aspects, is the objective of the integrated team

*From the Department of Pediatrics, New York Medical College, Flower and Fifth Avenue Hospitals, and Children's Center, Department of Welfare, City of New York.

(see Table 1) under the leadership of the executive director of the Center. The conselors for the nursery, boys' and girls' departments and the nurses act as parent substitutes. Social service workers investigate the child's background and plan his future placement. Clinical, psychological and psychiatric services are provided for evaluation of all the children and treatment for the more emotionally disturbed. The recreation department plans the daily activities for the children, such as swimming, ball games, movies, parties, etc.

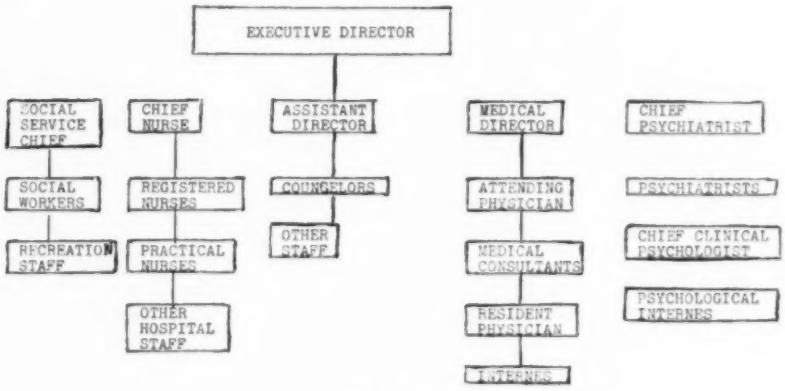

TABLE 1

The Pediatric Department of New York Medical College, Flower and Fifth Avenue Hospitals, which is located across the street from Children's Center, is responsible for the medical care of the children, and is oriented to function as part of the team. A pediatric resident spends three to four months of his two years' residency at the Children's Center under the supervision of the attending pediatricians. He thinks of himself as the family physician and uses the hospital consultation staff, laboratory and other facilities whenever necessary. One chief nurse, six registered nurses, and nine practical nurses staff a thirty-two bed infirmary, the school-age clinic and the pre-school clinic.

ROUTINE ADMISSION EXAMINATION

There are separate reception units for pre-school children, school-age boys and school-age girls. Ordinarily, social service has been unable to secure an adequate medical history.

Our initial approach in the handling of these children is very important. Most of the children admitted to the Children's Center have had little love or security, but rather outright rejection. It is easy to understand why many are overaggressive or extremely shy and withdrawn. An appreciation of this background is necessary for the team's proper orientation toward care of the children.

Within the first 24 to 48 hours they are to be examined completely and given certain tests by the doctors and nurses, e.g., Schick, tuberculin, Wood's lamp, if over 12 years, Wassermann. Their anxiety must be great. It would be additional psychological trauma to force examinations and tests on these children. Experience dictates a slightly different approach with each age group, depending on their stage of growth and development.

In the pre-school group: We try not to be abrupt. The child is given a chance to look us over. A little time is taken to play with him and smile at him. When the child is ready, the examination is usually easy with the nurse taking the place of the mother. If the child is extremely fearful, it is wiser to wait for a day or so, until he feels more secure.

In the school age children: We are friendly and pleasant, but occasionally firmness may be necessary. We have found such comments useful, as, "Let's get this over with so that you can go swimming or see movies with the other children." "The needle may hurt a little, but you can shout and cry if you want to" and "We'll help you to hold your arm still." Unending patience is necessary.

In the adolescent children: They are given a complete explanation of what and why something is to be done. Their permission is asked for examination and tests. No pelvic examination is made on the girls unless there is a specific indication.

During the period from January 1951 to July 1952, of 1000 school-age children who were examined on admission by the resident and staff pediatricians, the following abnormalities were noted:

Dental disorders	over 700
Trichophytosis	over 500
Pediculosis	39
Systolic murmur	37
Skin infections, bruises, etc.	33
Diseases of eyes	26
Tinea capitis	16
Phimosis	9

Upper respiratory infections	9
Orthopedic problems	7
Possible endocrine problems	6
Diseases of ears	6
Vaginal discharges	6
Mental retardation (obvious)	3
Hydrocele	1

The children with abnormal physical findings are investigated and treated whenever possible at the Center. The more difficult problems are referred for consultation, when necessary, to the various specialty clinics at the Flower and Fifth Avenue Hospitals. The responsibility for following through rests upon the resident pediatrician at the Center. Children who remain for prolonged periods at the Center are rechecked at least every six months. During the summer, children are examined before they go to the various camps.

Some of the medical problems encountered in the school-age group and their routine care are outlined below:

1. Dental Disorders: Over 70 per cent of the children had dental caries. Most children with caries were treated at East Harlem Dental Clinic and most of the extractions were done at Flower and Fifth Avenue Hospitals.

2. Trichophytosis: Over 50 per cent of school-age children have athlete's foot. A study with various therapies was done at the Center in 1951.[1] The application of the new fungicidal agents did not prove to be superior to corn starch or talcum powder which were used as controls.

3. Pediculosis: The following routine has been satisfactory. Cuprex is applied generously and remains in the hair for 30 minutes. A fine comb is used to remove the nits on the hair. The hair is shampooed and then fine-combed and then shampooed lightly again.

4. Tinea Capitis: The diagnosis is confirmed by Wood's light and culture. We have found no very effective treatment for M. audouini infections, while those with lanosum respond readily to almost any treatment. Other institutions refuse to take children with ringworm so that children often must remain for prolonged periods at the Center. Prior to 1951, all children were required to wear caps. This was psychologically traumatic for they were ridiculed by the other children and made to feel different. They

now are not separated from the others and there has been no spread or increased incidence of tinea capitis in the dormitories.

5. Systolic Murmur: The 37 children with a systolic murmur were all referred to the Children's Cardiac Clinic at Flower and Fifth Avenue Hospitals for further investigation. Six were diagnosed as inactive rheumatic heart disease and three as congenital heart disease. The other 28 were found to be functional murmurs.

6. Scabies: Scabies responded well to benzyl benzoate or 5 per cent sulphur ointment.

7. Ear Disorders: Foreign bodies in the ear canal are common at the Center, e.g., beans, lead pencil heads, cotton, paper, small screws, beads.

8. Vaginal Discharges: Of the six cases with vaginal discharges, none of them had positive cultures for gonococcus, and all cleared with good hygeine.

OUT-PATIENT DEPARTMENT

At daily morning clinics, there are usually about 30 to 40 children who have been referred by the counselor (parent substitute). They complain of headaches, abdominal pains, colds, pain and aches, etc. Few are really physically ill. Therefore a study has been carried out to explore the extent to which psychogenic factors cause the complaints which bring these children to the clinic. Many of the complaints are found to be expressions of emotional tension and anxiety.

A 15-year-old boy provided a simple illustration of what the psychosomatic study demonstrated. He had a mentally defective mother and his father died when he was twelve. He first came to the clinic with an infected scratch of the arm. The wound was dressed every morning. When it was getting better, he purposely took off the dressing and scratched it so that he could keep on coming to the clinic. Later he came for headaches and abdominal pains. He was a very unhappy boy, who verbalized "Nobody loves me and nobody wants me." With proper psychological care, he made a good adjustment. He is now doing well in a foster home.

IN-PATIENT CARE

There is a 32-bed infirmary with registered and practical nurses

on duty 24 hours a day. A child may be referred from the clinic or directly by the counselor for observation. Most of the infirmary admissions are for illnesses which would ordinarily be treated in the home, e.g., upper respiratory infections.

The pediatric resident acts as the family physician. He makes his daily friendly rounds in the infirmary to care for the children with upper respiratory infections, acute tonsillitis, otitis media, etc. Infectious illnesses, such as chickenpox, measles and mumps, are sent to Willard Parker Contagious Hospital as soon as the diagnosis is made. Difficult diagnostic problems which need more complete work-ups are sent across the street to Flower and Fifth Avenue Hospitals and are followed by the same pediatric resident. All children who are to be hospitalized may become apprehensive and frightened whether they show it or not, and are carefully prepared psychologically.

The resident pediatricians have the opportunity to see the children during the early stages of any illness. This experience is very valuable with proper supervision by the attending pediatricians. During the period from January 1951 to July 1952, the following types of illnesses were treated in the infirmary:

Upper respiratory infections	626
*Observation	476
Acute tonsillitis	120
Skin infections	78
Otitis media	59
Minor injuries	54
Gastroenteritis	35
Bronchitis	20
Cervical lymphadenitis	18
Dental disorder	13
Intestinal parasites	10
Asthma	8
German measles	7
Atypical pneumonia	6
Scabies	6
Foreign body	4

*These children were admitted to the infirmary for observation because of varied complaints, such as headaches, stomach pains, other pains and aches, etc. Many of these complaints were psychogenic in origin and the patients sought infirmary care as an escape from reality. Some were admitted for observation because the counselors had been over-zealous and noted flushing of the face, loss of appetite, loss of usual activity, etc. No other definitive diagnoses could be made after careful study.

The following illustrate preventive medicine experiences:

1. **Measles:** In late January 1952, there were 37 cases of measles

at the Center. All preschool children were given 6 cc. and school children 10 cc. of gamma globulin. During the same period, on admission all children were also given gamma globulin. There were four cases in February and none in March. The Center has not been quarantined during the last 5 years.

2. Diarrhea: In June 1951 there were 2 cases of severe diarrhea. As soon as the first stool culture revealed Shigella, these were isolated and all the other children and the employees at the Center were given sulfonamides for three days. Fourteen children and adults in all developed diarrhea, there were no further cases after two weeks.

PSYCHOLOGIC SERVICES

Under the leadership of the executive director, John J. Murphy, the Children's Center has developed a psychiatrically oriented program for care of our children.[2] The orthopsychiatric personnel at Children's Center consists of one chief psychiatrist, 10 hours per week; one associate psychiatrist, 10 hours per week; one psychiatric case supervisor, full time; seven psychiatric case workers, full time; one director of psychological services, 10 hours per week; one clinical psychologist, 10 hours per week; three clinical psychologists in training giving a total of 45 hours per week. In addition to the above, a child guidance team from the Manhattan State Hospital, engaged in a special experimental and training program, is in attendance two and a half days per week. The pediatric resident and attending pediatricians are under the supervision of the chief psychiatrist as to psychological care of the children.

A child is referred for psychiatric evaluation if unusual behavior, such as, temper tantrums, persistent fighting, over-aggressiveness, withdrawal, running away, etc., is observed by the counselor, nurse, pediatric resident or social worker. On the basis of the available family and personal history of the child, physical examination, including neurological, psychological testing (both psychometric and projective tests are used) and psychiatric interview with the child, the psychiatrist makes a complete diagnosis and outlines therapy. The child is then assigned to a psychiatrist, psychiatric social worker, or to the pediatric resident for therapy, under the direct supervision of the chief psychiatrist.

The Psychiatric Staff Conference is an excellent medium for

in-service training. This is a weekly conference attended by psychiatric personnel, pediatricians, counselors, nurses, recreation workers and the class room teachers. At the conference the case supervisor introduces the problem-case to be presented. The psychiatric case worker reports on the history and background, as well as the events which led to the child's placement. The counselor describes the child's reaction to placement and his behavior in the Center. The clinical psychologist interprets the findings of the psychometric and projective tests. The pediatrician summarizes the medical work-up while at the Center. The teacher gives an evaluation of the child's educational achievements and his attitude and behavior in the class room. The examining psychiatrist reports on the interview with the child, his impression and recommendations. Following this, there is a general discussion with focus on the typical aspects which apply to large numbers of children at the Center. The conference is concluded with a summation by the Chief Psychiatrist, which includes the final diagnosis and recommendations for present, as well as future care of the child. This weekly conference gives the entire staff of the Children's Center a planned opportunity for learning and understanding the psychiatric significance of children's experience and behavior.

In a survey[3] of 200 children who were referred for psychiatric evaluation, the diagnostic categories and the background of the children which contributed to these disturbances are listed below:

Diagnostic Categories

	No. of cases
Psychoneuroses	85
Primary behavior disorders	71
Character disorder	23
No gross psychopathology	10
Organic	5
Psychoses	4
Mental deficiency	2

Prolonged Absence of One or Both Parents for Multiple Reasons (Both parents living together in only 13 out of 200 cases)

	Total No. of Reasons
Separation (incompatibility)	59
Death	51
Illegitimacy	51
Mental illness	51
Severe physical illness (T.B., cancer, etc.)	49
Long term imprisonment	8

Asocial Traits in Parents

Alcoholism	57
Neglectful father or mother (court adjudicated)	37
Promiscuity or prostitution in mother	26
Criminality	8
Other asocial behavior	7

The following history illustrates how we attempt to achieve total child care.

Fred is a 10-year-old Negro boy who came to the Children's Center with three siblings because of absolute neglect at home. They were poorly clothed, dirty and hungry. The Social Service worker found that the home was filthy, and the mother an alcoholic who entertained numerous unidentified men. The children were on the street all the time. Fred's father had deserted the mother when Fred was 3 years old. His whereabouts were not known. The paternity of the other children remained unverified. Fred's mother was a dull normal illiterate and had to be admitted to a hospital for advanced tuberculosis.

On admission Fred was rather hostile and suspicious and, even with patience, there was difficulty in making the examinations. Although the Mantoux was positive there were no radiologic or other evidences of tuberculosis. He had ringworm of the scalp which was found to be due to Microsporon audouini. The response to therapy was slow and Fred was uncooperative.

During his stay at the Center, the counselors reported that he adjusted poorly in the dormitory. He engaged in frequent fights, threatened the others with a knife, used obscene language, and often ran away. He was also enuretic (urological studies revealed no organic cause for his enuresis.)

On the psychometric tests, Fred attained a verbal I.Q. of 75, a performance score of 83 and full scale of 77. However, the psychologist felt that Fred was a boy of average intelligence and good ego strength, with healthy emotional strivings. He had had educational deprivation, emotional insecurity and lack of affection.

The psychiatrist felt that there was a real deprivation on an emotional and material level in this boy's life experience. His behavior was the result of his hostile feelings toward a society which had not contributed much to satisfy his needs for love and security. The diagnostic impression was an anxiety state in an

insecure and "love starved" boy. Fred's case was discussed by the chief psychiatrist with the entire staff. He was assigned to a psychiatric social worker for supportive therapy to help him face the realities of life. The administrator, counselors, teachers, social workers, pediatricians and nurses understood his real needs and treated him with sympathy and affection.

We could see a gradual change in his attitude when he came for his daily treatment for ringworm of the scalp. When he had to be confined to bed in the infirmary for an upper respiratory infection he was surprisingly cooperative. Fred is continuing to make good progress, the psychometrics mirror the improvement. The Social Service worker is trying to find a foster home for him. We hope to follow his progress in the coming years and believe he can become a happy useful citizen.

SUMMARY

Care of the total child includes not only the physical but the mental, the psychologic or emotional and social aspects as well. An integrated and properly psychologically oriented team of administration, pediatricians, counselors, nurses, teachers, psychologists, psychiatrists, social workers and other personnel can help these children, whose temporary stay in the Center is an important phase in their growth and development.

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A STUDY OF MONGOLISM AND NON-MONGOLOID MENTAL RETARDATION IN CHILREN*

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This article is based on a clinical research study of 206 cases of monogolism, or congenital acromicria with mongoloid features, and 115 cases of the non-mongoloid mentally retarded children sometimes referred to as "Familial Mentally Retarded Children." The study extends over a period of 25 years. Graphs, tables and figures will be included to illustrate the salient points. My aim is to forward a reasonable theorem to explain the probable causes responsible for this intrauterine abnormal pattern of fetal growth.

Schüller[1] in 1907, Clift[2] in 1922, and Benda[3] in 1949 referred to their cases of mongolism the new terminology, i.e., "Congenital Acromicria," indicating thereby that the pituitary gland is hypofunctioning in this condition, contrasting it to "Acromegaly" or pituitary gland hyperfunction. To the author the terminology of "Congenital Acromicria with Mongoloid Features in Children" to replace the name of "Mongolism," seems to fit in more appropriately with the pathology and diagnosis of this condition.

The author's observations, derived from the above study, pointed to a consistent finding of a common anatomical skeletal growth retardation pattern involving the bones of the middle third of the face and the skull fossae. They are the nasal, maxillary, cribriform plate, vomer, ethmoid, sphenoid and occipital bones. This deficiency of bone growth and their small size is more prominent in the mongoloid children. This discovery spurred the author on to explore further this clinical work in the hope that prophylactic measures can be instituted to reduce the high ratio of mentally retarded newborn.

Table I is a summary of the clinical research work comprising five study sectors. The prenatal period, guidance and care, are very important.

The following prenatal conditions found in this clinical research study made interesting observations. It brought to light the important role that a normal functioning, strong and healthy mater-

*Presented at the October 1952 meeting of the East Side Clinical Society, N. Y.

TABLE I

(206) CASES OF CONGENITAL ACROMICRIA WITH MONGOLOID FEATURES						(115) CONTROLS OF NON-MONGOLOID FAMILIAL MENTAL DEFECTIVES					
SIBLINGS BORN BEFORE THE AFFECTED CHILD 672 OR 83%			SIBLINGS BORN AFTER THE AFFECTED CHILD 135 OR 17%			SIBLINGS BORN BEFORE THE AFFECTED CHILD 324 OR 49%			SIBLINGS BORN AFTER THE AFFECTED CHILD 338 OR 51%		
NUMBER OF AFFECTED CHILDREN BORN TO MOTHERS ACCORDING TO THEIR AGE GROUPS						NUMBER OF CONTROL CHILDREN BORN TO MOTHERS ACCORDING TO THEIR AGE GROUPS					
19 YEARS	20-24 YEARS	25-29 YEARS	30-34 YEARS	35-39 YEARS	40-45 YEARS	19 YEARS	20-24 YEARS	25-29 YEARS	30-34 YEARS	35-39 YEARS	40-45 YEARS
4	18	23	38	74	49	16	31	56	28	18	6
HISTORY OF MISCARRIAGES IN MOTHERS OF THE AFFECTED, AND THE CONTROL GROUP OF CHILDREN											
OF THESE, 80 MOTHERS OR 39% HAD MISCARRIAGES						OF THE 115 CONTROL MOTHERS, 16 OR 14% HAD MISCARRIAGES					
19 YEARS	20-24 YEARS	25-29 YEARS	30-34 YEARS	35-39 YEARS	40-45 YEARS	19 YEARS	20-24 YEARS	25-29 YEARS	30-34 YEARS	35-39 YEARS	40-45 YEARS
1	5	7	19	29	19	0	1	3	5	5	2
MISCARRIAGES BEFORE AND AFTER THE MONGOLOID BIRTHS ACCORDING TO THE MATERNAL AGE GROUPS											
		BEFORE			TOTAL			BEFORE			TOTAL
1	0	6	21	42	25 95	0	1	2	3	2	2 10
		AFTER			51			AFTER			6
0	5	6	27	12	1 146	0	0	1	2	3	0 16

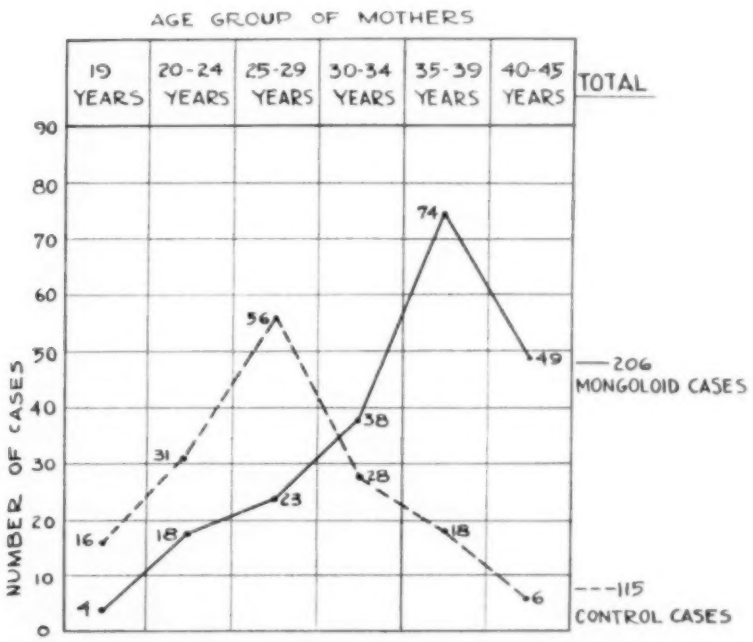
CAREFUL CHECK OF THE TWO GROUPS OF MOTHERS' DAILY DIETS HAVE BEEN MADE

CALORIC INTAKE	NO. OF MOTHERS	%	PROTEIN INTAKE	NO. OF MOTHERS	%	CALORIC INTAKE	NO. OF MOTHERS	%	PROTEIN INTAKE	NO. OF MOTHERS	%
UP TO 1500	112	54½	BELOW 60 GRAMS	186	90	UP TO 1500	70	60	BELOW 60 GRAMS	82	70°
1500 – 2000	65	31	FROM 60-85 "	20	10	1500 – 2000	24	21	FROM 60-85 "	33	30
2000 AND UP	29	14½				2000 AND UP	21	19			

FROM 65% TO 72% OF THE MOTHERS OF BOTH GROUPS OF CHILDREN GAVE A HISTORY OF INSUFFICIENT INTAKE OF VITAMINS A, B COMPLEX, C AND D OR MINERALS AS SUPPLEMENTARY TO THEIR DAILY DIETS DURING THEIR GESTATION PERIODS.

nal reproductive organism can play during fertilization of the ovum, the growth pattern of the growing embryo and the development of the fetus to term throughout the entire gestation period. The maternal reproductive organism can be diseased, exhausted, weakened and made ineffectual by varying conditions and circumstances affecting the host which may affect the growth pattern of the de-

GRAPH 1



THE SOLID LINE INDICATES THE MATERNAL AGE GROUPS IN WHICH 206 CASES OF CONGENITAL ACROMICRIA WITH MONGOLOID FEATURES WERE BORN; WHILE THE BROKEN LINE IS INDICATIVE OF THE MATERNAL AGE GROUPS IN WHICH THE CONTROL FAMILIAL MENTALLY DEFECTIVES WERE BORN

veloping fetus in utero. For this reason, the author considers the prenatal period as the most important for the expectant mother to receive proper guidance throughout the gestation months from the attending physician.

Most of the author's observations on this subject of the maternal influences on the development and growth pattern of the fetus can be put under the following five sections:

1. The mother's age when pregnant with the affected child. The position of the affected child in relation to the normal siblings of the family. The number of normal children born before and after the mentally retarded child, and the history of the mother having an unusual long sterile period prior to the pregnancy of the affected infant.

2. The previous menstrual history and history of interrupted pregnancies, if any, and the present state of the maternal hormone balance or imbalance during the early weeks of gestation offers important clues to alert us.

TABLE II

ORDER OF BIRTH OF THE MONGOLOID GROUP OF CHILDREN
(ONE TO SIX CHILDREN TO THE FAMILY)

1ST BORN	2ND BORN	3RD BORN	4TH BORN	5TH BORN	6TH BORN
28					
14	32				
9	12	27			
2	7	9	23		
2	2	5	7	11	
0	0	1	0	5	10
		TOTAL 206			
55	53	42	30	16	10

3. The influence of virus and bacterial infections and contagion upon the pregnant woman, as may affect the developing fetus, must be considered. When available, gamma globulin was given intramuscularly in 2cc. to 4cc. doses under such circumstances as a prophylactic measure.

4. The role hereditary factors play in relation to the developing fetus, and the newborn.

5. The role nutrition for the expectant mother plays in its influence upon her reproductive organism, and upon the growth pattern of the developing fetus.

Each study section will be taken up separately.

One. Of 206 mothers of mongoloid children, 161, or 79 per cent,

were between 30 and 45 years of age at the time of their pregnancy with the affected child. The peak of the mongoloid births occurred in mothers between 35 and 40 years of age, in which group 74, or 36 per cent, of the mothers gave birth to mongoloids, and 45, or 21 per cent, of the mothers were below 30 years of age, and a few above 45 years of age. In the familial mentally retarded children's group of 115 mothers, the peak-age of their pregnancies were between 25 and 29 years. In this group we had 56 mothers, or 49 per cent, and 59, or 51 per cent, were women below 25 years of age, and those above 29 years of age. The difference of 10 years between the groups of mothers, as shown in Graph 1, of the peaks of the affected newborn, made up the difference between a potential maternal intrauterine mongoloid fetal growth pattern, and one that is not.

Table II illustrates the position of the mongoloid births in the line of family siblings in this clinical study. The youngest child in a large family is most likely to be the mongoloid one. In the series of 206 mongoloid children in families from 1 to 6 children, the affected ones were mostly in the last position of the family siblings. In the familial mentally retarded group it made no difference. They were born in any position among the family siblings. In Table I, we notice that among the 206 mothers of mongoloid children, 83 per cent of their normal siblings were born before the affected newborn, and only 17 per cent after. Of the 115 mothers of the familial non-mongoloid group, there were 324 children, or 49 per cent, of the normal siblings born before, and 338 children, or 51 per cent, born after. In this group it made no difference. In over 25 per cent of the mothers of the mongolism cases there was a history of a sterile period of from 5 to 10 years prior to the mongoloid pregnancy, while, in 15 per cent of the familial type retardation cases, we had a similar history of a prolonged sterile period prior to the affected pregnancy. It suggests that fertilization of a dormant ovary may affect normal growth and development of the fetus. Exhaustion and weakening of the maternal reproductive organism through age and multiple births, are apparently other contributory factors.

Two. The author observed a rather high index of interrupted pregnancies among the mothers of the mentally retarded children. This is summarized in Table I. In 80 of the mothers of mongoloid

children, or 39 per cent, we had a history of spontaneous abortion, and 41 per cent of the mothers have given birth to premature babies. In the familial mentally retarded children group, 16 mothers, or 14 per cent, had spontaneous abortions, and 11 per cent of the mothers gave birth to premature babies. Both groups of mothers had a high index of interrupted pregnancies, as compared to a general average of less than 1 per cent of interrupted pregnancies among mothers of the general population in geographical areas and maternity hospitals. Hertig and Rock[4] discovered abnormal ova in about one-half or more of their specimens of early ova in spontaneous abortions. Dyscrinism may be a cause contributory to this result. Fraenkel[5], many years ago, referred to a condition of maternal hypopituitary function; hypothyroidism and deficient corpus luteum will produce an inadequate luteal phase of the endometrium resulting in an unsecure nidation site from the point of view of deficient ovular nutrition. During the gestation period, there is a constant changing and readjustment of hormone activity of its secretions taking place in the expectant mother. All of these changes must be close to an adjusted hormone balance to benefit the maternal reproductive organism and the developing fetus.

A woman's body is constructed to give rise to a new generation. During her reproductive period the physiology of the pelvic organs and ductless glands are altered. As soon as the ovum is fertilized, new hormone production is started. The Langhans' cells secrete chorionic gonadotropin which is excreted in big amounts into the urine, and is responsible for the so-called Aschheim-Zondek pregnancy test. The syncytial cells secrete progesterone and estrogenic hormones. About the 56th day of gestation a critical period occurs within the gravid uterus. The placenta is developed, and it takes on special functions. There is a precipitous drop in the excretion curve of urine gonadotropin and a reciprocal rise in secreting syncytial steroids of estrogen, and a greater amount of progesterone. Another important finding at this time, reported by Krebs and Bartlett[6], is that the fetal pancreas secretes chymotrypsin at this period. An excess of serum estrogenic hormone at the 56th day of gestation predisposes the woman to uterine hemorrhage and possible abortion. Such mishap is protected by the presence of an increase of a trypsin-like enzyme in the maternal blood stream which helps digest estrogenic protein keeping a normal blood

estrogenic balance, thereby resisting fetal harm. Dr. Evan Shute[7], in analyzing the biochemical changes during gestation leading to uterine bleeding, interrupted pregnancy and fetal malformations found an excess of serum estrogenic hormone and a diminished amount of serum trypsin enzyme, and deficient amounts of vitamin E.

Three. Influence of Contagion: In three mothers of mongoloid children, two contracted German measles and one measles, during the first trimester of their pregnancy. Swan[8], Gregg[9] and Fox[10] et al. reported cases of congenital defects in babies born to mothers who contracted contagious diseases and other virus and bacterial infections while pregnant.

Four. Heredity: This is questionable as a factor in mongolism. In my study, I have seen only one case of twins in whom one child was a mongoloid, and the other normal. It is indeed very rare to find a pair of mongoloid twins. In only one other family did I come across two mongoloid brothers, one was 12 years of age, and the other one year. There was a sterile period of 11 years between the two. The mother was 41 years old when pregnant with the second child. She was very ill throughout the pregnancy. She subsisted on orangeade, tea and toast, because of constant vomiting and dislike for food throughout the gestation period. Benda[11], in a study of 500 cases of mongoloid children, concluded that heredity was of no importance as a factor in the etiology of mongolism. My observations are in agreement with his. There may be a rare occurrence of a spontaneous mutation. This would be too insignificant to even suggest that a genetic factor is at fault or responsible. One can accordingly assure an anxious mother to the effect she is most likely to have a normal baby following a previous retarded child. Proper spacing is advisable at about 1½ to 2½ years between the affected child and the next pregnancy. Proper prenatal guidance and care become essential.

Five. Nutrition: In all of the mothers of the mentally retarded children, the daily optimum intake of protein fell much below par during their pregnancies. The women who gave birth to babies with a high index of pediatric rating were those who consumed from 85 to 100 grams protein (of animal and vegetable origin) with their daily diet. Supplements of vitamins and minerals, and a sufficient intake of food calories daily are necessary too.

Of the mongoloid group of cases, 186 mothers, or 90 per cent, had a daily protein intake of less than 60 grams, and only 20 mothers, or 10 per cent, had a daily intake of 60 to 85 grams protein. 112 mothers, or 54.5 per cent, took less than 1500 food calories in their daily diet with no supplementary vitamins or minerals, while 65 mothers, or 31 per cent, consumed between 1500 and 2000 calories, and supplements of vitamins and minerals. Only 29 mothers, or 14.5 per cent, consumed more than 2000 calories with a sufficient intake of vitamins and minerals in their daily diets. In the study of the mothers of the familial mentally retarded group, 82 mothers, or 70 per cent, consumed less than 60 grams protein daily, and 33, or 30 per cent, consumed from 60 to 85 grams protein daily. 70 mothers, or 60 per cent, consumed less than 1500 calories with insufficient amounts of vitamins and minerals in their daily diets, and 24 mothers, or 21 per cent, consumed between 1500 and 2000 calories daily. Only 21 mothers, or 19 per cent, were on an adequate diet and supplements of vitamins and minerals.

Dieckman and co-workers[12] reported a definite and striking correlation between the incidence of abortion and protein intake daily. While abortions occurred in 8.11 per cent of the patients consuming less than 55 grams protein daily, and 3.96 per cent of those with protein intake of 70 to 85 grams, it was nihil in the subjects who consumed more than 85 grams protein daily. They also reported that the pediatric ratings of 302 babies born to these mothers show upon examination a steady increase in percentage of generally "excellent babies" with increasing maternal protein daily intake in their diets.

Price[13] made a valuable contribution for better understanding of nutrition and its relationship to growth processes and physical degeneration, through nutritional research studies. He traveled thousands of miles into the deepest isolated jungles, spending many years mingling with the native savages of primitive men, women and children, to study their native foods and their daily diets. He desired to know why entire isolated populations had such perfect bodies, excellent teeth and jaws, strong muscles, sound minds and good health. He made a study of 14 isolated and modernized tribes from the Eskimos of Alaska, the Gaelic in the inner and outer Hebrides, the Swiss, the Indians in the far north, west, and central Canada, and western United States, tribes of eastern

and central Africa, the Melanesians and Polynesians of the South Pacific Isles, and the aborigines of Australia.

He observed that the coastal tribes ate sea foods and sea weeds rich in vitamins, minerals and food values. Those living inland used very rich soil tilled with good fertilizer, and lots of phosphorus, calcium and other minerals for their farming, thereby producing nourishing young crops very rich in minerals and vitamins. It made excellent pasture for their live stock. Their cattle and hogs were enormously big and strong. They produced richly nourishing dairy and meat-food products. The whipped butter was yellow and according to Price[13] contained a vitamin X, having qualities of preventing teeth decay and other physical degenerative processes. Their fruits and vegetables were also unusually tasteful and big, and rich in food value, and protective for health conservation generally.

A comparative study was made of the primitive natives living in isolated villages modernized by visiting white men from civilized countries, such as, soldiers, fur-trappers, hunters and tourists. The latter bartered their unprotected food-stuffs, namely, refined white sugar, refined flour, polished rice, jams, jelly, a variety of canned goods, chocolates and hard candies, smoked fish and vegetable fats with the natives, in exchange for pearls and trinkets.

The natives ate full meals made out of these delicacies. Their general health began to break down and obvious signs of physical degeneration made their appearance among the men, women and children. The contrasting results here, as compared to those of the tribes in the isolated areas not visited by civilized white men, were quite evident. After a short period of time elapsed many of the natives suffered from massive tooth decay, malnutrition in all stages, osteomyelitis, focal and general infections, furunculosis became common, tuberculosis was rampant, mental retardation and mongolism and disorders of mentation became evident in the new generation of children.

The physical degeneration that became so obvious among the natives alarmed the tribal chiefs. They, therefore, ordered all couples contemplating marriage to report to their tribal chief. A committee of two men were appointed to take care of the couple for a period of six months, during which they were responsible for selecting their proper food-stuffs, prepare their daily diets, and

take care of their health. At the end of this period, the couple would have to pass a physical test, and then be permitted to marry. The wife was obligated to report her first signs of pregnancy to the tribal chief. The same committee was reappointed to take care of her as to her daily diet, proper food-stuffs, and good health until she gave birth to her newborn. The daily diets were rich in proteins and big quantities were given, also rich in vitamins and minerals. The committee members in charge would be punished if anything

FIG. 1

went wrong in the health of the mother or the newborn baby. This ruling helped materially in conserving the health of the primitive populace. It was an excellent step forward in medical prophylaxis.

In this study Price[13] made a very interesting observation. He noticed that the offspring of the suffering populace showed a common growth pattern. The bones of the middle third of the face were undeveloped, small and narrow, and that many of these newborn babies gave evidence later of mental retardation and mongolism characteristics.

Figures 1 and 2, illustrate the front and side views of a mongoloid boy, permitted to be shown here through the kind courtesy

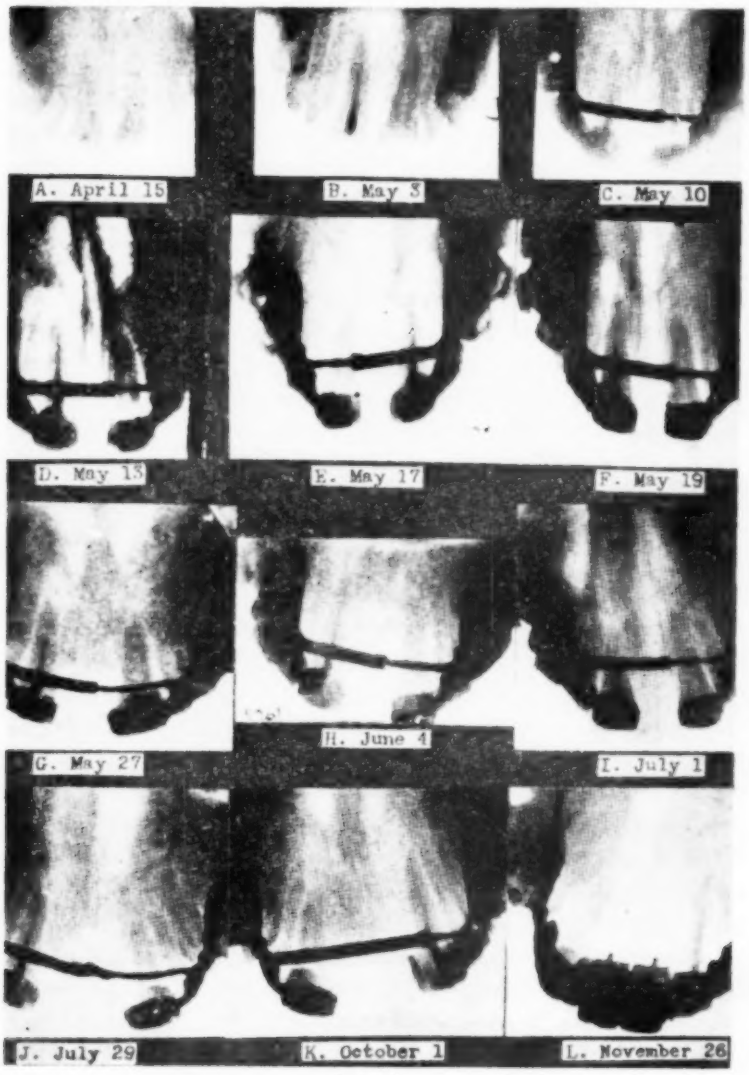


FIG. 2

and approval of the Dr. Weston A. Price, Committee of the American Academy of Applied Nutrition, Los Angeles, Calif.

It concerns a 16-year-old boy with a mentality of 4 years, hav-

ing typical mongoloid features. His mother was 49 years old when he was born. He played with baby rattles and blocks. His nostrils were very narrow, making sleep and breathing very difficult. Believing the limited function of the pituitary gland was responsible for this trouble, Dr. Price decided to operate. He widened the upper arch in graduating steps to a width of one-half inch by opening the median palatal suture. Within 30 days the boy was able to breathe freely and sleep comfortably. A mouth appliance was fitted and put securely in place. The bone filled in rapidly. The space between the central incisor teeth was filled in by two artificial porcelain teeth on a restoration. The lateral movements and outward rotation of the separated maxillary bones, brought on by repeated acts of masticating food and speaking, caused an exertion of a downward tension and pressure upon the temporal bones, thereby lowering the sphenoid bone and cranial floor, giving the brain and the pituitary gland more space and freedom of action for better functioning. This relieved the former compression and cramping of the vital and mentally functioning brain and the pituitary gland functioning freeing their former limitations. The results were amazing.

This boy passed through the stages from infancy to adolescence within several weeks that would ordinarily take several years. His genitals developed from those of a child to that of a young man within 3 months. He grew 4 inches in 4 months, and grew a moustache and beard in 6 months when he began to shave. His mental improvement ran parallel to the physical. He started to associate with boys and girls his own age and attended dances and sociables. He traveled great distances alone, bought his own clothes and essentials, getting the correct change. Several months later an interesting observation was made about the boy. He wore a fixed mouth appliance that kept the upper palatal arch widened permanently about one-half inch. This appliance became dislodged. The maxillary bones settled together. In a few days the boy lapsed into his old condition of lethargy and slipping mentality. With the immediate readaptation of the mouth appliance fixed securely into place, he soon returned to his former improved condition. This is an instance of anatomical and physiological proof verifying the clinical findings, in which, upon removal of the limited functions to the pituitary gland and brain cortex by giving both

more room and freedom through oral surgery, there appeared better physical and mental functions and responses.

It is interesting to quote the work of Dr. Samuel Rosner[11] and Dr. William Sharpe,[15] of New York City, who performed unilateral and bilateral subtemporal decompression when indicated upon familial type, and mongoloid mentally retarded children who showed high elevated mercury and water manometer readings upon spinal taps. They observed the condition of the brain contents after its exposure upon incising the dura. It appeared pulseless and lifeless, and its color was a dead-pan-gray. The most frequent living pathology of the brain they have observed—and the author with one of them (Dr. Rosner)—was a bunch of veins, some dilated and even close to aneurism appearance, and in few instances capillary angiomas. They would bleed easily. Electric cautery would remove most of the pathology and bring bleeding under immediate control. The operative field was fascinating to observe. Within a few minutes the pulseless vessels and the dead-pan-gray bulging brain from pressure, would upon this release from the former pressure by the bone decompression, change to a back to life brain of a good circulating pink color, and its blood vessles pulsating actively again. Other functions of the brain showed improvement as time went on postoperatively. There was improved muscular tone and co-ordination, improved gait, better adjustment of the emotions, and improved speech in most cases.

Sharpe,[16] in 1922, performed routinely spinal punctures upon 500 newborn babies in the City Hospital, Welfare Island, City of New York, to spot out early diagnosis of cortical hemorrhage cases. It is said statistically, that 1 to 1½ per cent of the newborn have some degree of cortical hemorrhage. Dr. Sharpe found bloody spinal fluids, and in few just blood stained fluids, averaging 9 to 9½ per cent of his cases. He then performed daily spinal taps in the babies showing bloody spinal fluids until the spinal fluid came clear in at least two taps. This required an average of 2 to 5 spinal taps. These babies were tapped at first about 24 to 48 hours after birth. Within a few minutes after exposure, the bulging, pulseless, gray, sickly-looking brain changes to a healthy pink color with lively pulsating vessels brought fully into view.

It's important to diagnose the condition of cerebral hemorrhage in babies early, within the first 24 to 48 hours after birth, when

the free blood is in fluid form. We can accomplish this by an early spinal tap. The bloody spinal fluid can be drained off through daily spinal tappings until clear. Sharpe[16] reports, "that not only will the usual 10 per cent mortality occurring in the first month after birth of such cases be diminished, but also, the frequency of the latter condition of cerebral spastic paralysis will be avoided, and the number of pitiful chronic cases, so often classified in the large group of 'defective children and mentally retarded ones' lessened. It seems to me, that at least those newborn babies who appear drowsy soon after birth and show poor sucking ability, refusing to nurse or take the bottle, should be entitled to receive a spinal tap. It is so harmless, so simple, and a great forward stride in medical progress and medical prophylaxis. Neurosurgery is making great progress and has a definite place in playing an important role in the therapy and prophylaxis in cerebral palsy and mental retardation."

PATHOLOGY

It takes an untreated mongoloid child about 10 years to mature to the equal of a mental age of 2 to 4 years. The head measurements are equal to the level of a 1 to 2-year-old child. There is a characteristic smallness of the infant's skull. The occipital bone is flattened from above downward. The clinoid processes are stubby and often bent.

The author observed from his research study of the mentally retarded children that their anteroposterior head diameter was from 1½ cm. to 3½ cm. shorter than that of the normal child for their respective ages. The bitemporal diameter is shorter by 1 cm. to 1½ cm., and the biparietal diameter is ½ cm. to 1 cm., less than the normal. The mongoloid children, having relatively higher I.Q. ratings, showed very little difference in their bitemporal and biparietal head diameter measurements comparable to the normal. But their anteroposterior skull diameter did show the shortening of 1½ to 3½ cm. The familial type mentally retarded children showed somewhat narrower measurements of the bitemporal and the biparietal diameters by 1 to 1½ cm., as compared to the mongoloid children. Their anteroposterior diameter of the skull is from 1 to 1½ cm. longer than the mongoloid a-p diameter of the head.

I believe that in view of the above findings, in addition to other

observations, such as, the underdevelopment of the facial bones of the middle third of the face, small size and position of the sphenoid, and the occiput with its unusual flat shape, we are dealing with a comparatively smaller brain bone case in the retarded child than the normal child. This smallness sort of cramps and compresses the brain and pituitary gland contents which are soft and growing expanding organs in an unyielding hard bony enclosure, thereby limiting its freedom of normal functioning, its expansion and normal growth, proportionate with the age. We therefore have in these mentally retarded children a condition of disturbed pituitary gland and brain physiology, because of a defective growth pattern of the facial skeletal development, affecting the anatomical structures of the middle third of the face and skull case. In mongolism the orbits are egg-shape and at a slant, instead of being round and horizontal, thereby giving the child the mongoloid features and characteristic facial appearance.

Himwich and co-workers[17] have found a slowing-up of brain metabolism and activity in the mentally retarded child. They found the normal brain to consume 14.2 mgm.% carbohydrate from each circulation, and about 35 to 50 per cent less in the mongoloid and the severely mentally retarded children. The brain depends upon this for its fuel and energy. The normal infant's brain takes up 8.59 vol.% oxygen, while the mongoloid, and, the severely familial type mentally retarded children's brain takes up about 3.63 vol.% oxygen from the blood stream. This is a reduction of 57.7 per cent, which corresponds very closely to the percentages of most retardation of the children.

Davidoff,[18] Benda[19] and Sergio-Levi[20] report varying degrees of brain and nerve pathology in mongolism, and familial type mental retardation of children, from near normal to marked parenchymatous changes. Hemorrhages, cysts, adhesions, angiomas, collections of veins, aneurisms of vessels and degenerative changes of the brain, and lesions of the ductless glands have been described. Shallow cerebral convolutions and abnormal fissues were found. Undeveloped nerve paths and immature spinal cord and irregularities of the gray matter with immature myelinization of the nerve fibers have also been observed. Hydrocephalus is another frequent condition encountered. Absence of pituitary basophile granules or its lack, and presence of colloid material in swollen pituitary cells have been found by Benda.[21] Myxedema, congenital heart

lesions, transposed and small blood vessels, abdominal viscera, small liver, small kidneys and large spleen are other findings. X-rays of the ossification centers of the humerus, femur, pelvis and wrist bones will show early delay giving a clue to early diagnosis. The bones are uneven in density, and thin in places. The long bones are shorter and thinner. The little fingers are curved because the middle phalanx is small. The fingers and hands are stubby.

It is erroneous to estimate the life span of a mongoloid, or the familial type retardation child, to be from 10 to 12 years. The badly pathologically implicated children usually die during their first year of life. Those who survive the first five years, barring disease and accident, can live a full adult life.

LABORATORY FINDINGS

An average of 15 urine specimens per patient have been examined. A negative Sulkowitch test was found in more than 75 per cent of the cases, indicating a lack of calcium utilization. This was cleared up with thyroid extract and calcium therapy. Three urine specimens showed a positive phenylpyruvic acid reaction. Blood examinations showed a slight rise in cholesterin and its esters, the fibrinogen, the eosinophiles, total granulocytes, staff cells and chlorides, The blood-sodium, reticulocytes and lymphocytes were diminished. The white cell count averaged 7,500, from a low of 5,000 to a high of 10,000. 143 children had a red blood cell count from 4 to 5 million, and hemoglobin 75 to 100 per cent. 23 children had a red blood cell count from 3½ to 4 million per mm., and hemoglobin of 55 to 75 per cent. The others were on the borderline of the normal.

The spinal fluids of several of the mongoloid children showed a mercury manometer reading of 8 mm. to 12 mm., and of the familial retarded cases readings from 10 mm. to 18 mm. mercury (normal is 6 mm. to 8 mm.). The spinal fluids were chemically and microscopically normal.

A NEW MENSURATION METHOD OF RATING MENTALLY RETARDED CHILDREN

In my own work, I discarded, about 25 years ago, the use of the low I. Q. ratings of the retarded children and their classification into *morons, imbeciles* and *idiots*. This stigmatized them with the

label of rejected human stock. In most cases the unfortunate affected children were not only rejected by their parents, the community in which they live, and relatives and friends, but also, by their family physician, the consultant, the clinic and the public schools.

The author devised a new intelligence and adaptability scale that conforms within the scope of the child's ability, talents and potentials. Through this sensible scale we avoid pitfalls, shamefulness and rejection of the children. These children are ill children. They are docile, affectionate and lovable children, and, therefore, they should be accepted everywhere, and treated with a sympathetic and friendly approach by the physician, the parent, teacher, the psychiatrist, psychologist, social service worker, speech therapist and the physiotherapist. The mensurate intelligence method is as follows:

After attaining the child's I. Q., adaptability, performance and social maturity ratings, we observe further the child's play and actions, and, after assembling the data, we judge the child as a whole unit. Accordingly he is classified into a mental comprehension scale mensurable as to his own understanding, ability and potentials, into a rating of M-1 (good), M-2 (fair), M-3 (borderline to poor), and M-4 (poor).

The *M* represents the unit of mental comprehension of words, numbers, persons, things and places in his environment; the *numbers* represent the grade, and the child's potentials for development. A child with an I. Q. of 65 and over, having a good social maturity record, is placed in M-1 scale. With an I. Q. of 45 to 65 and a fair social maturity rating, he is placed in M-2. Those with an I. Q. of 30 to 45 with a fair social maturity rating are put into M-3, and the children with a low I.Q. below 30, and a poor social maturity record are put into the M-4 classification rating. As a rule the children in the M-1, M-2, and about 40 per cent of the M-3 group are educable and trainable. The balance of the M-3 group, and 40 per cent of the M-4 group of children are trainable. The remainder of the children very often are found proficient as helpers to the other trained workers in a number of vocations.

Mongoloid children and the familial mentally retarded children are sick children. The approach in caring for them should be with understanding, kindness and sympathy with an aim to gaining their

confidence in us. With proper endocrine correction and medical care, psychiatric and psychologic guidance, physiotherapy; play and speech therapy, and vocational school training, they can learn a great deal. They can learn a trade, and how to communicate with one another, and keep happy. There should be a classroom for every child at every age group. Day camps are a good substitute for institutions, except for very bad cases. The children can have school and play by day, and the affection of the home and community by night and week ends. Chaperoned social entertainment should be encouraged.

Medical colleges should have in their teaching curriculum student courses in teaching and training pupils in the prenatal essentials for better obstetrics and pediatrics, and in the prophylaxis and treatment of the mentally retarded children.

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317 E. 17th Street.

INTERVERTEBRAL-DISC LESIONS

A New Etiological Concept

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Our knowledge of the pathology of the intervertebral-discs is a modern development, mostly within the last quarter century. It is more than likely that lesions of these structures were equally if not more prevalent in earlier times, but were not generally recognized until x-ray technique became a major factor in physical diagnosis. Another reason for non-recognition of these lesions may have been the fact that the vertebral column is so firmly bound together with ligaments and fasciae that it has not been customary to make minute examination of these structures in routine anatomical dissections or post-mortem investigations. The extensive post-mortem studies of Schmorl (1927-1932) gave initial impetus to the subject, following which there has been a constantly expanding bibliography.

The intervertebral-disc lesions most commonly met with consist of mass or partial displacement ("slipping discs") or rupture of the annulus fibrosus with herniation of the semi-fluid nucleus pulposus, often resulting in disabling neurological lesions from impingement on spinal nerve structures. These lesions of the discs have usually been related etiologically to traumatism, although a definite history of such is obtainable in a minority of cases. The possibility of preconditioning etiological factors, in the form of degenerative changes, has been intimated by most writers, but the exact nature or cause of such changes has not been clarified.

In the earlier etiological concepts the role of congenital defects was emphasized. Later functional strain, or traumatism superimposed upon such faulty tissue, was given prominence. According to Beadle,[1] "It is submitted as the most probable theory that certain faults in the texture of the cartilage matrix occur . . . and give rise to the rupture of the cartilage by minute traumatic influences that would have no effect upon perfectly normal tissue." As degenerative changes advance in the disc structure the elasticity of the annulus fibrosus and fluid content of the nucleus pulposus lessens, and this loss of function is sometimes hastened by deposition of cal-

cium and the efficacy of the confining fibro-elastic network is lost. When the stage of rupture and herniation is reached, the resultant lacerations are often accompanied by extensive hemorrhages, which further complicate the picture. That these lesions are not due to senile degenerative changes is shown by the age incidence, which, beginning in the second decade, reaches its peak in the fourth decade, after which it gradually declines. Key[2] has reported intervertebral-disc lesions in young children and adolescents.

From a carefully correlated study of the nutritional background of subjects of intervertebral-disc lesions, and from the records of analogous post-mortem findings regarding the condition of cartilaginous structures in scurvy, as cited by Lind[3] in his classical treatise on this subject (1753), the writer is convinced that deficiency of vitamin C plays an important etiological role in these lesions.

The most definitely established physiological function of vitamin C is that of assisting in the formation of collagen for the maintenance of stability and elasticity of connective tissues generally, and this would include the bones, cartilages, muscles and vascular tissues, in fact all tissues of mesenchymal origin. In deficiency of the vitamin, instability and fragility of all such tissues is believed to be caused by the breakdown of "the intercellular cement substance" (collagen), resulting in easy rupture of any and all of these connective tissues, which would include the intervertebral-discs.

Today the hemorrhagic tendency is regarded as a cardinal symptom of deficiency of vitamin C, or sub-clinical scurvy; but Lind[3] makes a more subtle observation. After reporting that in scurvy the muscles, in post-mortem examination, are found to be so "lax and tender that they readily fall apart" he records a similar "laxity" of the intestinal musculature, and continues: "Why the scurvy should so frequently, and in so singular a manner, affect the cartilages of the ribs, so as sometimes to separate them altogther from their connection with the breast bone, and why it seats itself so commonly in the joint of the knee, I own I am at a loss to account for."

In this connection, Lind[3] cites the pathological findings of Willis, the great English anatomist, of "circle of Willis" fame, who, in his "Tractus de Scorbuto" (1667), relates a symptom which he had

observed several times, viz., "a crackling of the bones upon moving the joints. Even upon turning in bed, by rubbing of the vertebrae on each other, a considerable noise was perceived, like to the rough handling of a skeleton," which, he remarks, is an almost sure sign of incurability.

Lind[3] also cites similar findings reported by the great French surgeon, Poupart,[4] whose name is linked with "Poupart's ligament," and who, in his many post-mortem studies on scurvy victims in Paris (1699), is quoted as follows: "In some (clinical scurvy cases), when moved, we heard a small grating (crepitus) of the bones. Upon opening these bodies (post-mortem) the epiphyses were found entirely separated from the bones, which by rubbing against each other occasioned this noise. In some we perceived a small low noise when they breathed. In those (post-mortem) the cartilages of the sternum were found separated from the bony part of the ribs. All those in whose breast (chest) any matter or serosity was found, had their ribs thus separated from the cartilages, and the bony part of the ribs next the sternum was carious for four fingers breadth. . . . The ligaments of the joints (throughout the body) were corroded and loose. Instead of finding in the cavities of the joints the usual sweet oily mucilage (the synovial fluid) there was only a greenish liquor. All the young persons under eighteen had in some degree their epiphyses separated from the body of the bones."

If such gross cartilaginous lesions were found in times past in frank cases of scurvy, it is only logical to conclude that lesions of lesser degree, such as we now find in the intervertebral-discs, the semilunar cartilages of the knee, the sacroiliac synchondrosis, etc., may be etiologically related to deficiency of vitamin C in the many unrecognized subclinical cases of scurvy. These modern lesions of cartilaginous structures differ from those of frank scurvy only in degree. In all such lesions, whether involving dislocation of the discs or cartilages, or rupture and herniated extrusion of their collagenous contents, there is obvious evidence of loss of stablity of the connective tissues involved, which can be accounted for physiologically by nutritional deficiency of vitamin C.

It would seem almost unbelievable that in this day and age, when fresh fruits and vegetables are so plentiful, any of our population should be found deficient in vitamin C; but, during the last

fifteen years in the writer's practice as a nutritionist, more than five thousand qualitative chemical tests for vitamin-C status in clinical cases have been made, and less than 10 per cent of adult subjects have been found to be at optimal level in this respect. It is true our infants and young children are better provided for in this respect than at any time in the past, since it is now routine practice to include citrus and other fresh fruit juices in their diet from early infancy until they leave the nursery. Then there follows a marked nutritional deterioration, due to the inroads of candy, soft drinks, etc., and later, in teen age and early adult life, tea, coffee, tobacco and alcohol, further distort the normal nutritional pattern.

Vitamin C (ascorbic acid), aside from its action as a vitamin, is a potent chemical-reducing agent, being thus capable of neutralizing both inorganic and organic toxines, such as lead poisoning in painters, rattle-snake bite and scorpion sting. For this same reason, ascorbic acid has powerful chemotherapeutic effect in infectious diseases, as stressed by the author[5] in previous papers. But this chemical action is reciprocal, in that the vitamin suffers a proportionate loss, making less available for physiological needs. As evidence of this reverse effect, the writer has found, in clinical and laboratory research, that the smoking of one cigarette neutralizes in the body approximately 25 mgm. of ascorbic acid, or the equivalent of the vitamin-C content of one average-size orange. On this basis, the ability of the heavy smoker to maintain normal vitamin-C status from dietary sources is obviously questionable, and this alone may account for the prevalence of vitamin-C deficiency in our modern adult population. Incidentally, the writer has found that all his intervertebral-disc cases have been heavy smokers and definitely C-hypovitaminotic by chemical test.

If the writer's hypothesis, as herein set forth, is sustained a new field is opened for the prophylactic and therapeutic use of vitamin C. Even, as a means of testing the validity of this hypothesis, supplemental therapeutic trial of the vitamin, in liberal dosage, should be made as part of the non-surgical management of all suitable cases of intervertebral-disc and other cartilaginous lesions. It is conceivable that such means might result in fixation of a slipping disc or cartilage and prevent rupture and herniation of same. "An ounce of prevention is worth a pound of cure."

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Hypertrophic Pyloric Stenosis in Children. (Journal of Irish Medical Association, Dublin, 32:165, June 1953). McNicholl reports on 143 infants with a pyloric tumor palpated by an experienced pediatrician on more than one occasion. There were 117 males and 26 females, corresponding to the usual sex incidence of 4 or 5 to 1. Medical treatment was attempted in 88, and was successful in 57. Surgical treatment was used alone in 55 cases, and in 31 others it followed varying periods of medical treatment. Selection of one type or other of treatment was made according to various pediatricians' personal views, and not according to the criteria advised by the author. Surgical treatment is indicated in infants in whom vomiting commences during the second week or earlier, the weight is below that at birth, severe obstruction appears suddenly and there is severe dehydration. Suitable correction of the dehydration must, of course, precede the operation. Severe infection or generalized disease and slight obstruction or late onset are contraindications to surgical treatment. Indications for medical treatment are vomiting that commences in the fourth week or later, and which has persisted for three weeks or more when the child is first seen and the weight loss is nevertheless small; also moderate or severe alkalosis (after suitable correction). Contraindications to medical treatment are severe obstruction and dehydration, and perhaps hematemesis. The feeding procedure during medical treatment is outlined. Treatment with atropine methyl nitrate (Eumydrin) is described. Surgical treatment is discussed only from the pediatrician's point of view, with emphasis on the preoperative and postoperative management. Three infants died, two from complicating infections some weeks after successful surgical treatment. The author feels that approximately half of all infants with pyloric stenosis can be satisfactorily treated by medical means, with special emphasis on atropine methyl nitrate.—*Journal A.M.A.*

ABSTRACTS

VAN DE KAMER, J. H.; WEIJERS, H. A. AND DICKE, W. K.: COELIAC DISEASE. IV. AN INVESTIGATION INTO THE INJURIOUS CONSTITUENTS OF WHEAT IN CONNECTION WITH THEIR ACTION ON PATIENTS WITH COELIAC DISEASE. (Acta Paediatrica, 42:223, May 1953).

Based on the results of an investigation of a number of patients with coeliac disease, the harmful action of wheat flour was shown to be chiefly inherent to the gliadin fraction. AUTHORS' SUMMARY.

CLAESSON, U. AND LINDQUIST, B.: USE OF HYALURONIDASE IN SCLERODERMA. (Acta Paediatrica, 42:278, May 1953).

One case of generalized progressive scleroderma in a 10-year-old girl is described. ACTH and para-amino-benzoic acid had no or contrary effect, while hyaluronidase showed a good effect on the skin lesions as well as on the tissue indurations.

AUTHORS' SUMMARY.

TURTON, E. C., AND SPEAR, A. B.: E.E.G. FINDINGS IN 100 CASES OF SEVERE ENURESIS. (Archives of Disease in Childhood, 28:316, Aug. 1953).

The E.E.G.'s from 100 cases of severe enuresis but without any organic condition were studied in detail. Only 26 of these were completely normal and a further 23 were on the borderlines of normality. Of the abnormal records, 28 showed a too slow or immature type of record. A further one showed an organic type of tracing. The remainder, 22 in all, were of an epileptiform type with 14 of these showing typical seizure patterns either at rest or during activation procedures. AUTHORS' SUMMARY.

CHAN, K. F. AND BROWN, H. W.: THE TREATMENT OF PINWORM (ENTEROBIUS VERMICULARIS) INFECTION WITH BACITRACIN AND SULFASUXIDINE. (Journal Pediatrics, 43: 290, Sept. 1953).

Bacitracin and sulfasuxidine, when administered simultaneously, are effective in the removal of the pinworm of man. Treatment for 5 days produced a 77 per cent cure rate, while a 7-day course apparently cured 91 per cent of the patients. The combined therapy is more effective than either agent employed alone against enterobiasis. AUTHORS' SUMMARY.

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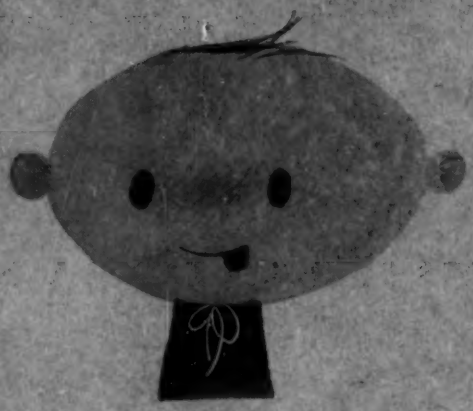

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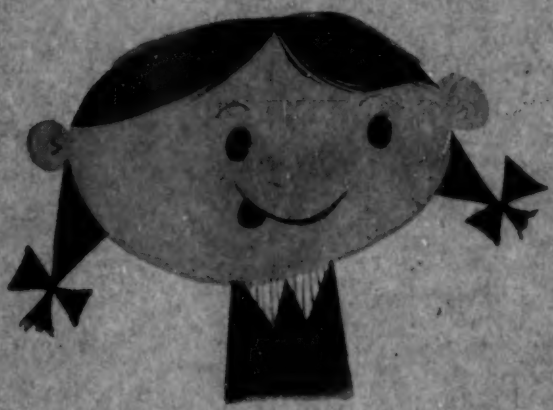

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Supplied: Bottles of 1.0 Gm.

Oral Suspension *(Flavored)*

Each 5 cc. teaspoonful contains 250 mg. of pure crystalline Terramycin. Effective against gram-positive and gram-negative bacteria, including the important coli-aerogenes group, rickettsiae, certain large viruses and protozoa.

Supplied: Bottles of 1.5 Gm

Pfizer **PFIZER LABORATORIES,** *Brooklyn 6, N. Y., Division, Chas. Pfizer & Co., Inc.*